

FEDEROFF DECLARATION

Exhibit A

CURRICULUM VITAE

NAME: Howard Joshua Federoff

ADDRESS: Office:
Georgetown University Medical Center
Office of the Executive Vice President
for Health Sciences and Executive Dean
4000 Reservoir Road, NW Room 120 Building D
Washington, DC 20007

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6513 Kenhill Road
Bethesda, MD 20817

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EMAIL: hjf8@georgetown.edu

DATE OF BIRTH: March 24, 1953

CITIZENSHIP: U.S.A.

EDUCATION

1974 B.A. Earlham College, Richmond, IN
1977 M.S. Albert Einstein College of Medicine, Bronx, NY
1979 Ph.D. Albert Einstein College of Medicine, Bronx, NY
1983 M.D. Albert Einstein College of Medicine, Bronx, NY

POSTGRADUATE TRAINING

1983-1984 Intern in Medicine, Massachusetts General Hospital, Harvard Medical School, Boston, MA
1984-1985 Resident in Medicine, Massachusetts General Hospital, Harvard Medical School Boston, MA
1985-1986 Clinical Fellow in Endocrinology, Massachusetts General Hospital, Harvard Medical School, Boston, MA
1986-1988 Clinical and Research Fellow in Endocrinology, Massachusetts General Hospital, Harvard Medical School Boston, MA

BOARD CERTIFICATION

1987 Internal Medicine
1989 Endocrinology & Metabolism

LICENSURE

1983-1988 Licensed in Commonwealth of Massachusetts
1988-Present Licensed in New York State

ACADEMIC APPOINTMENTS

7/88-6/1993 Assistant Professor of Medicine and Neuroscience, Albert Einstein College of Medicine, Bronx, NY
7/93-4/1995 Associate Professor of Medicine and Neuroscience, Albert Einstein College of Medicine, Bronx, NY
5/95-3/31/07 Professor of Neurology, Medicine, Microbiology and Immunology, University of Rochester School of Medicine, Rochester, NY
5/95-8/2003 Founding Chief, Division of Molecular Medicine and Gene Therapy, University of Rochester School of Medicine, Rochester, NY
6/96-3/31/07 Professor of Oncology and Genetics, University of Rochester School of Medicine, Rochester, NY

- 2/97-9/2001 Director, University of Rochester Interdepartmental Neuroscience Program, University of Rochester, Rochester, NY
5/98-3/31/07 Founding Director, Center for Aging and Developmental Biology, Aab Institute of Biomedical Sciences, University of Rochester, Rochester, NY
10/02-3/31/07 Senior Associate Dean for Basic Research, University of Rochester School of Medicine, Rochester, NY
4/1/07-present Executive Vice President and Executive Dean, Georgetown University Medical Center, Washington DC

AWARDS AND HONORS

- 1974-1978 USPHS T321982
1979-1983 ACS Special Postdoctoral Award
1983 Alpha Omega Alpha Election
1997 Arthur Kornberg Research Award, University of Rochester
1998 Who's Who in America
1999 Who's Who in the World
2002-Present Founding member and Director, Parkinson's Gene Therapy Study Group
2003 Grass Lecturer, Kansas City Chapter of the Society for Neuroscience
2004 NINDS designate to NIH Neuroscience Blueprint
2005 Abreu Memorial Keynote Lecturer; The University Texas Medical Branch
2006 NIH Neuroscience Blueprint co-chair Workshop on Neurodegeneration
2006 Selection as Chair of NIH Recombinant DNA Advisory Committee (RAC)

PROFESSIONAL MEMBERSHIP

- American Association for the Advancement of Science
New York Academy of Science
Society for Neuroscience
American Society of Gene Therapy
American Diabetes Association
American Society for Experimental Neurotherapeutics
American Academy Neurology

EDITORIAL BOARDS

- 1999- Present *Brain and Mind*
1999- Present *Experimental Neurology*
2000- Present *Gene Therapy Reviews*
2000- Present *Gene Therapy*
2002- Present *NeuroRx*

CORPORATE INTERACTIONS

- Consultant, Promega Corporation 1996-2000
Founding Scientist, Socratech, LLC, 2000
Consultant, Integrated Nano-Technologies, LLC, 2000 - 2005
Consultant, Abbott Pharmaceuticals, 2001
Consultant, Avigen, Inc., 2001-2003
Consultant, Amgen, Inc., 2003 - 2005
Founding Scientist, AmpliVex, LLC, 2002-present
Founding Scientist, MedGenesis, 2005
Founding Scientist, The Vaccines Conspiracy, 2007

SPECIAL COURSES

- 1977 - Cold Spring Harbor Laboratory, Advanced Bacterial Genetics
1986 - Marine Biological Laboratory, Woods Hole, Neurobiology
1992 - Cold Spring Harbor Laboratory, Mouse Embryology

CLINICAL EXPERIENCE

- 1988-1989 Attending Physician, Baker Medical Service, Massachusetts General Hospital
1989-1995 Attending Physician, Medical Service BMHC Hospital
1989-1995 Attending Physician, Endocrinology, BMHC Hospital
1989-1995 BMHC, Endocrine Outpatient Clinic
1989-1995 Consulting Endocrinologist, Weiler Hospital, AECOM
1995-1999 Endocrine clinical practice, URMC

TEACHING EXPERIENCE

- 1992-1995 Director and Lecturer, Section on Neural Development, Graduate Neuroscience course, Albert Einstein College of Medicine
1995-1996 Lecturer, Cell Signaling, Department of Pharmacology, University of Rochester School of Medicine and Dentistry
1996 Lecturer, Neurobiology of Disease, Department of Neurobiology and Anatomy, University of Rochester School of Medicine and Dentistry
1996-2000 Lecturer, Medical Genetics
1997-2000 Lecturer, Endocrine Physiology, University of Rochester School of Medicine and Dentistry
1997-2003 Lecturer, Cellular Neuroscience, University of Rochester School of Medicine and Dentistry
1998-1999 Lecturer, Principles of Behavior Analysis, University of Rochester School of Medicine and Dentistry
1998-2000 Lecturer, Toxicology Core Course, University of Rochester School of Medicine and Dentistry
2001- Instructor, Ph.D. Readings in Neuroscience, University of Rochester School of Medicine and Dentistry
2001 Lecturer, Neuroscience Investigative Seminars, Department of Neurosurgery
2001-2007 Lecturer, MBB II: Advanced Basic Sciences, Development & Degeneration: A Life-Long Balance Influencing Brain Function
2002-2007 Lecture, Aging Case Series
2004-2007 IND 408; Biochemistry
2004-2007 Academic Research Track for Medical Students
2007 Georgetown University Medical Center Lecturer

COMMITTEE SERVICE

Local

- 1989 - 1995 Steering Committee, Medical Scientist Training Program, Albert Einstein College of Medicine
1995-1997 University of Rochester Medical Center Strategic Planning Committee
1995-1997 University of Rochester Medical Center Strategic Implementation Committee, Aging and Development
1995-2007 Neurology Executive Committee, URMC
1995 Search Committee, Chief, Pediatric Hematology-Oncology, Department of Pediatrics
1995-1996 Graduate Student Admissions Committee, Department Microbiology and Immunology
1996 Chair, Thesis Defense, D. Luan, Department of Biology
1996 Chair, Qualifying Committee for Jeffrey Rumbaugh, Department of Biochemistry
1996-1998 Thesis Committee for Jeffrey Rumbaugh, Department of Biochemistry
1996-2000 Users Committee, URMC New Building Design
1997 Thesis Committee for Derek Choi-Lundberg, Dept. of Neurobiology & Anatomy
2000 Thesis Committee for Jing Niu, Department of Biology
2000- 2001 Search Committee, Chair, Department of Ophthalmology
1997-1999 Thesis Committee for Ganesan Satya, Department of Biochemistry and Biophysics
1996-1998 Search Committee, Chair, Department of Biochemistry and Biophysics
1997-1998 Search Committee, Chair, Department of Environmental Medicine
1997-2007 Committee for MD Degree with Research Distinction
1997-1998 Search Committee, Directors for Vaccine Biology and Cancer Centers
1999-2000 Search Committee, Department of Ophthalmology

1999-2007 Executive Committee of the Schmitt Program on Integrative Brain Research
1999-2007 Graduate Education in the Basic Sciences/Basic Science Depts. /Research Committee
1999-2000 Chair, Users' Committee of the Transgenic Mouse Core Facility
2000-2001 Search Committee, Vivarium Director, Department of Laboratory and Animal Medicine
2000-2001 Search Committee, Chief, Department Endocrinology
2000 Rand Corporation
2000 Search Committee, Chair, Department of Neurosurgery
2001 Thesis Committee for Liz Lipscomb, Department of Toxicology
2002 Thesis Committee for Chiayu Chiu, Neuroscience Graduate Program
2002- Search Committee, Chair, Department of Biomedical Genetics
2002 Chair, Qualifying Committee for Michael Froehler, Neuroscience Graduate Program
2002 Thesis Committee for Chiawen (Kitty) Wu Neuroscience Graduate Program
2003 Search Committee, Translational Physician Scientists, Cancer Center
2003 Board Member, Institutional Biosafety Committee (IBC), University of Rochester
2003-2004 Search Committee, Dept. of Medicine Human Genetics Program
2002-2007 Technology Transfer Steering Committee, URMC
2002-2003 Management Committee; URMC
2002-2007 Executive Committee; URMC
1998-2003 Steering Committee, MEDSAC; URMC
2004-2007 Academic Honors Program Executive Committee; URMC
2001-2007 Incentive Committee; University of Rochester Medical Center
2003-2007 Executive Committee, MD/PhD Program; URMC
2003 Chaired Strategic Planning for Research, URMC
2004-2005 Computer Committee, URMC
1996-2006 Goldberg Lecture Selection Series, URMC
2004- University Advisory Committee, University of Rochester Presidential Search
2005-2006 Led Strategic Planning for Basic Research, URMC
2005-2006 Strategic Planning Steering Committee, URMC
2005-2007 Chair, Office of Corporate Alliance Scientific Advisory Committee, URMC
2005-2007 University of Rochester Management Committee
2006 University of Rochester Technology Transfer, Intellectual Property Working Group
2006-2007 Chair, Johnson and Johnson Discovery Fund review Committee, URMC

National

1996-1999 Member, NLS3 Study Section
1999-2003 Chair, BDCN3 Study Section
2000-2001 NIH MDCN IRG Working Group
2000-2005 Board of Scientific Counselors, NIDCR
2000- 2003 American Academy of Neurology: Ethics, Law and Humanities Committee
2001-2002 *Ad hoc* reviewer, Recombinant DNA Advisory Committee
2001-present Parkinson's Study Group Scientific Advisory Committee
2001-present Board Member, American Federation of Aging Research (AFAR)
2003 Chair, CDIN Study Section
2003-present Member, NINDS Spinal Muscular Atrophy Steering Committee
2003-2005 Member, Search Committee, NIDCR Scientific Director
2004-present Member, Vector Committee, ASGT
2003-present Board Member, Biomedical Research and Education Foundation (BREF)
2004-present Member, Steering Committee, first World Parkinson's Congress
2003-present Board member, NINDS SMA virtual biotech effort to develop small molecule therapy
2004-2006 Chair, Program Committee, first World Parkinson's Congress
2004 NINDS "Neuroscience Blueprint" Committee
2004-present High Q Advisory Group Consultant
2004-2005 GE Healthcare Medical Advisory Board
2005-2006 Board Member, Dystonia Therapeutics. A non-profit biomedical research organization
2005-present Member, Recombinant DNA Advisory Committee (RAC), NIH
2005 Member, Gene Therapy Adverse Events Board, RAC, NIH
2006 NIH Blueprint Co-Chair to 2006 area of emphasis: "Workshop on Neurodegeneration"

2006-present Chair, Recombinant DNA Advisory Committee, NIH

PEER REVIEWER

Journals

Aging Cell
Brain Research
Experimental Neurology
Gene Therapy
FASEB Journal
Human Gene Therapy
J. Neuroscience
Lancet
Lung
Nature Biotechnology
Nature Genetics
Nature Medicine
Neurobiology of Disease
Neurobiology of Aging
Neuron
Neuroscience
Neuroscience Letters
New England Journal of Medicine
Proceedings National Academy of Science

Grants

NSF, Neuronal and Glial Mechanisms, 1994 - 1997
Spinal Cord Research Foundation
NIH, NSRA, MHAI-2, Special Reviewer, 1995
Cystic Fibrosis Foundation- Gene Therapy
NIH, Neurology C Study Section, *Ad hoc* 2/95
Fighting Blindness Foundation, 6/96
Alzheimer's Association, 1997, 1998, 1999
NIMH, Special Emphasis Panel, 1997
Canadian MRC Centers of Excellence Program in Neuroscience, 1998
NIH, Neurological Sciences III, Standing member 6/95 - 2/98
NIH BDCN4, *Ad hoc* 6/98- 2/99
Department of Defense, NETRP, 1997- 1998
ALS Society, 1999
NIH BDCN3, Chair 6/99-7/03
Danish National Research Foundation, 2000-2001
The Jacob and Valeria Langeloth Foundation
Institute Brain Research and Dementia, University of California at Irvine, 2002, 2006
NIH CDIN, Chair 7/03
Rett Syndrome Foundation, 2005, 2006

TRAINEES

Predoctoral:

Bing Lu, M.D., Ph.D. candidate, 1992 - 1994
Alborz Hassankhani, MSTP, 1991- 1995
Michael Geschwind, MSTP, 1991- 1995
Adriana Rozental, Ph.D. candidate, 1992- 1995
Robert Starr, MSTP, 1992 - 1995
Andrew Brooks, Ph.D. candidate, 1994 – 2000
Marc Halterman, MSTP, 1995- 2002
Michael Derby, Ph.D. candidate, 1996 - 1997
Keith Barlow, Ph.D. candidate, 1996 - 1997
Joe Sanchez, Ph.D. candidate, 1996 - 1999
Brandon Harvey, Ph.D. candidate, 1996 – 2003
Renee Miller, Ph.D. candidate, 1999 – 2004
Yu (Agnes) Luo, Ph.D. candidate, 1999-present
Jason Hamilton, Ph.D. candidate, 2000-present

Douglas Short, Ph.D. candidate, 2000-present
Charles Wuertzer, Ph.D. candidate, 2000-present
Kuei-Cheng Lim, MSTP, 2000- 2005
Michelle Janelsins, Ph.D. candidate, 2003-present
Jill Weimer, Ph.D. candidate, 2000-2005
Xiaomin Su, Ph.D. candidate, 2004-present
Carolyn Tyler, Ph.D. candidate, 2005-present
Debbie Ryan, Ph.D. candidate, 2005-present

Postdoctoral: Bhaskar Mukherjee, Ph.D., 1993 – 1995
Peter Zahos, M.D., 1993 – 1994
Nariman Panahian, M.D., Ph.D., 1995 - 1997
William Bowers, Ph.D., 1995 – 1998
Timothy Corden, M.D., 1995 – 1996
Kathleen Maguire-Zeiss, Ph.D., 1996 - 2002
Hui Huang, Ph.D., 1997 – 2000
Craig Miller, M.D., Ph.D., 1998 – 1999
Eric Detrait, Ph.D., 1999-2001
Stephanos Kyrkanides, D.D.S., Ph.D., 1999 – 2000
Xiaowei Chen, M.D., Ph.D., 1999 - 2001
Seung Lim, Ph.D., 2001-2003
David Rempe, M.D., Ph.D., 2001 - 2003
Feng Xing, Ph.D., 2003- 2006
Christine Lilliehook, Ph.D., 2005 - 2007
Shabnam Alam, Ph.D., 2006 - 2007

PATENTS

Utility Patent: US 6,051,428

Issued: April 18, 2000

Title: Rapid production of autologous tumor vaccines

Inventors: Y. Fong, H. J. Federoff, and J. D. Rosenblatt

Utility Patent: US 6,156,306

Issued: December 5, 2000

Title: Pancreatic beta-cells for allogeneic transplantation without immuno suppression

Inventors: M. Brownlee, M. Horowitz, H.J. Federoff and S. Efrat

Utility Patent: US 8,747,328

Issued: June 26, 2001

Title: Production of Somatic Mosaicism in Mammals Using a Recombinatorial Substrate

Inventor: H.J. Federoff

Provisional Patent: Pending US 09/997,848

Filing date: 11/29/01

Title: Helper Virus-Free Herpes virus Amplicon Particles and Uses Thereof

Inventors: H.J. Federoff, W.J. Bowers, S. Dewhurst, T. Evans, J. Frelinger, and R. William

*Invention Disclosures were combined with 09/997,848:

*Provisional Patent: Converted US 60/206,497

Filing date: 5/23/00

Title: "Method for Producing HSV Amplicons and Uses Thereof"

Inventors: H.J. Federoff and W.J. Bowers

*Provisional Patent: Converted 60/250,079

Filing Date: 11/30/00

Title: "Development of Helper virus free HSV Amplicon vectors for Gene Therapy of Hematologic

Malignancies"

Inventors: K. Tolba, H.J. Federoff, W.J. Bowers, and J. Rosenblatt

*Provisional Patent: Converted 60/253,858

Filing Date: 11/29/00

Title: "Helper Virus-Free Herpes Virus Amplicon Particles and Uses Thereof"

Inventors:

*Provisional Patent: Converted US 60/385,230

Filing Date: 5/31/2002

Title: "Integrated HSV Amplicon Vector"

Inventors: H. J. Federoff and W. J. Bowers

*Provisional Patent: Pending US

Filing Date:

Title: HSV Amplicon-based Functional Genomics for Therapeutic Molecule Discovery

Inventors: H. J. Federoff, W. J. Bowers, and L. Henricksen

Provisional Patent: Converted US 60/626,064

Filing date: 1/18/01

Title: Gene Expression Profiling of Endothelium in Alzheimer's Disease"

Inventors: B. Zlokovic, H. J. Federoff

Provisional Patent: Pending US 60/356,964

Filing Date: 2/13/2002

Title: "Compositions and Methods for the Treatment of Parkinson's Disease"

Inventors: Howard J. Federoff and Renee M. Miller

Provisional Patent: Converted US 60/359,613

Filing Date: 2/25/2002

Title: "Glucocorticoid-Regulated VEGF Expression via Plasmid-based Delivery"

Inventors: H.J. Federoff and W. J. Bowers

Provisional Patent: Pending US 60/480,112

Filing Date: 6/20/03

Title: "Prevention of Treatment of Deficits that Arise in Connection of or Injuries to the Nervous System"

Inventors: H.J. Federoff, W.J. Bowers, V. Arvanian, and L. Mendell

Provisional Patent: Pending US 60/518,474

Filing Date: 11/07/03

Title: Compositions and Methods of Treating Neurological Disorders

Inventors: H. J. Federoff and W. J. Bowers

Provisional Patent: Pending US 60/700,758

Filing Date: 07/22/2005

Title: Biomarkers of Neurodegenerative Disease

Inventors: Paul D. Coleman, Howard J. Federoff, Kathleen Maguire-Zeiss, Timothy R. Mhyre, Roger M. Kurlan, Christopher Cox, Frederick Marshall

Provisional Patent: Pending US 60/700,565

Filing Date: 7/19/2006

Title: Alpha-synuclein antibodies and methods related thereto

Inventors: H.J. Federoff, K. Maguire-Zeiss, and M. Sullivan

Provisional Patent: Pending US 60/941,849

Filing Date: 06/04/2007

Title: Herpes Simplex Virus Amplicon Vectors Derived From Primary Isolates

Inventors: Stephen Dewhurst, William J. Bowers, Howard J. Federoff, John G. Frelinger, Michael C. Keefer

INVITED PRESENTATIONS 1995 – Present

“Gene Therapeutic Approaches for Neuronal Salvage”, Gene Therapy of Central Nervous Disorders University of Pennsylvania, Philadelphia, PA 6/95

“Genetic Therapy”, NIH Parkinson’s Disease Research Planning Workshop, Washington, DC, 8/95

“Gene Transfer in Neurobiology”, European Neuroscience Meeting, Amsterdam, NL 9/95

“Selective Cardiac Overexpression of NGF in Transgenic Mice”, University of Leiden, Leiden, NL 9/95

“Cellular and Molecular Treatments of Neurologic Diseases”, Harvard University, Cambridge, MA 10/95

“Network Modification”, Neurotrophic Factors in Development, Plasticity and Survival, Madison, WI 10/95

“Gene Transfer into the Nervous System: Implications for Disease Pathogenesis”, Annual Meeting of the American Neurological Association, Washington, D.C. 10/95

“Somatic and Germline Approaches for Neurotrophin Manipulation”, University of Pittsburgh, Department of Molecular Biology, Pittsburgh, PA 10/95

“Manipulation of a Network: Gene Targeting in Development”, Genova, Italy 3/96

“Neuronal Salvage”, The First Meeting of the Parkinson’s Disease Gene Therapy Consortium, Washington, DC, 4/96

“Genetics and the Use of Biomaterials” Moving into the 21st century: Frontiers in human tissue research, Philadelphia, PA, 4/96

“Gene Transfer: Applications of Viral Vectors for the Study and Treatment of CNS Disorders”, Co-Chair, Symposium, Society for Neuroscience Meeting, Washington, DC, 11/96.

“Somatic Mosaic Analysis of NGF Function” Winter Conference on Brain Research, 1/97

“Somatic and Germline Manipulation of Neurotrophin Function” University of Iowa, 4/97

“Gene Therapy for Parkinson’s Disease” United States House of Representatives Subcommittee on Appropriations” Washington, DC, 6/97

“Manipulation of NGF Function *in vivo*” Tufts University School of Medicine, 6/97

“Strategies to Ameliorate Neuron Death” 8th International Symposium on Stroke, Neurotrauma and Other Neurological Diseases” New Orleans, LA 7/97

“Gene Therapy for Neurologic Diseases” Promega Consultants Symposium, Madison, WI, 7/97

“Direct CNS Gene Transfer for Reduce Neuron Death” European Neuroscience Summer School, Amsterdam, NL, 8/97

“Gene Transfer into the Central Nervous System: An Experimental Tool and a Potential Therapy”, First Annual Brain Marrow Project Lecture, Memphis TN, 11/97

"Gene Transfer into the CNS" WCBR, UT, 1/98

"Perspectives in Neuroscience - Manipulation of NGF Expression within the Murine CNS", "Developing Gene Therapy for Neurological Diseases", 2 Lecture Series, Clinical Neurological Science Rounds, London, Ontario, 4/98

"HSV Gene Transfer: An Experimental Tool and Potential for Therapy", University of Toronto - Mount Sinai Hospital, Toronto Ontario, 4/98

"Viral Vectors", Fifth Annual Conference of the American Society for Neural Transplantation, Clearwater, FL, 4/98

"Introduction of Concept Clearance in Developmental Neurotoxicology and Neurodegenerative Diseases", Ninety-Fourth Regular Meeting of the National Advisory Environmental Health Sciences Council, NIH/NIEHS, Bethesda, MD, 5/98

"Gene Transfer to the Nervous System: Experimental Tool and Potential for Therapy", Symposium for Gene Expression in the Nervous System, Harvard Medical School, Boston, MA, 5/98

"Somatic Mosaic Analysis of NGF Function in the CNS", Molecular Biology Seminar Series, University of Kansas, Lawrence, KS, 5/98

"Gene Delivery and Gene Therapy Methodologies for CNS Applications", 2nd Cellular and Molecular Treatments of Neurological Diseases Conference, American Academy of Arts and Sciences, Cambridge, MA, 10/98

"Somatic Mosaic Analysis in Mice: An Approach to Study Gene Product Function in the CNS", A Satellite Symposium to the 1998 Society for Neuroscience Annual Meeting, Sponsored by NIAAA, NIH, Los Angeles, CA 11/98

"Genetic Modifications of the Brain: Strategies to Elucidate Function", Neuroscience Colloquium, University of Rochester, Rochester, NY, 2/99

"CNS Gene Transfer with HSV Vectors", Promega Corporation, Madison, WI, 4/99

"Probing the Function of NGF in the Adult CNS by Somatic Mosaic Analysis", Neuroscience Lecture, University of Wisconsin-Madison, Madison, WI, 4/99

"Hypoxic Signaling in Neurons", Chair, "Signal Transduction Session", First Gordon Conference on NeuroVirology, Seminar: "Adaptive and Pathophysiologic Signaling in Hypoxia", Colby Sawyer College, New London, NH, 6/99

"CNS Gene Transfer to Modify Learning", The American Society of Gene Therapy, Second Annual Meeting, Washington, DC, 6/99

"Approaching Gene Transfer to the Nervous System from the Inside and Out", Winter Conference on Brain Research, Breckenridge, CO, 1/00

"CNS Gene Transfer to Modify Learning", University of Connecticut Health Center, Farmington, CT, 2/00

"Gene Transfer to Modify Learning", University of Pennsylvania Health System, Philadelphia, PA, 4/00

"CNS Gene Transfer: Experimental Tool and Potential for Therapy", Neurology Grand Rounds, Johns Hopkins University, Baltimore, MD, 4/00

"Gene Transfer to Modify the Neural Substrate Underlying Learning and Memory", Cells and Genes and Their Applications for Therapies for the Brain, FASEB, San Diego, CA 4/00

"Applications of HSV Vectors for Experimental Neurobiology", NIH, NIDA, 5/00

"Methodologies for manipulating single genes in the adult", American Society of Gene Therapy 3rd Annual Meeting, Denver, CO 6/00

"Gene-experience Interaction Alters the cholinergic Septohippocampal Pathway of Mice", The Year 2000 Schmitt Symposium, University of Rochester, Rochester, NY, 8/00

"Genes, Environment, and Aging: Interaction and Involvement in Disease", Symposium on Aging, 75th Anniversary of the University of Rochester Medical Center, Rochester, NY, 10/00

"Gene Transfer to the Nervous System: Status and Promise for Therapy", Third Annual Meeting of the American Society for Experimental Neurotherapeutics, Washington, DC, 3/01

"Summary Report", Workshop on DoD Sponsored Parkinson's Related Research, Bolger Center, Potomac, MD, 3/01

"Gene Therapy: Scientific, Ethical and Regulatory Issues", 53rd Annual Meeting of the American Academy of Neurology, Philadelphia, PA 5/01

"Manipulation of Genes to Further our Understanding and Treatment of Disease", Washington Science Writers Seminar: Emerging Technologies & Interventions for Brain Repair, Washington, DC 5/01

"Modes of Gene Delivery and Expression in the CNS", 4th Annual American Society of Gene Therapy, Seattle, WA 5/01

"Amplicon Vector Gene Transfer to Evaluate Nervous System Function", 4th Annual American Society of Gene Therapy, Seattle, WA 5/01

"Principles of CNS Gene Therapy", Bench science research: implications for treatment of TBI, National Brain Injury Association 20th Annual Symposium, Atlanta, GA 7/01

"Bionomics Analysis of Hypoxic Injury", Pediatrics Travel Club, Rochester Academy of Medicine, Rochester, NY 9/01

"Probing the Aging CNS Functions by Gene Transfer", Brain Aging-Identifying Accelerators and Brakes, San Diego, CA 11/01

"Evolving Perspectives on CNS Gene Therapy", Winter Conference on Brain Research, Aspen, CO, 1/02

"Experience, Plasticity and the Aging Brain", Adler Foundation Symposium, Salk Institute, Torrey Pines, CA, 1/02

"Molecular Dissection of Pathologic Mechanisms: Integrative Bionomics", Cellular and Molecular Treatments of Neurological Diseases Conference, American Academy of Arts and Sciences, Cambridge, MA, 3/02

"Molecular Mechanisms of Alzheimer's Disease", Case Seminar in Aging, Monroe Community Hospital, Rochester, NY, 4/02

"Stem Cells: Biologic and Ethical Issues", University of Rochester, Rochester, NY 4/02

"Plasticity and the Aging Brain", William Hall Symposium, University of Rochester, Rochester, NY, 5/02

- “A Celebration of Science: The Healing Power of Knowledge”, Harvard Club of New York City, NY 5/02
- “Molecular Genetic Manipulation of the Adult Central Nervous System”, Workshop on “Aging in the Nervous System”, University of Michigan, Ann Arbor, MI 5/02
- “Dissection of Neurologic Disease Mechanisms by Gene Transfer”, Scientific Symposium, 5th Annual American Society of Gene Therapy, Boston, MA 6/02
- “Gene Transfer Strategies for Treatment of Neuromuscular Disorders”, Corporate Symposia, 5th Annual American Society of Gene Therapy, Boston, MA 6/02
- “Evolution of Gene Therapy for Parkinson’s Disease”, Annual Parkinson’s Disease Symposium, Radisson Inn, Rochester, NY 9/02
- “Response to injury at the Cellular Level: Defense and Compensation”, Parkinson’s Disease: The Life Cycle of the Dopamine Neuron, A New York Academy of Sciences Conference, Princeton, NJ 9/02
- “CNS Diseases Amenable for Gene Therapy”, Ernst Schering Research Foundation Workshop 43 - Human Gene Therapy: Current Opportunities & Future Trends, Berkeley, CA 10/02
- “Genetic Approaches to Study CNS Function and Repair”, Schmitt Program on Integrative Brain Research Symposium - Cellular Approaches to the Understanding of CNS Development, Damage and Repair, University of Rochester, 10/02
- “NGF: Constitutive and Activity Dependent Modulator of Synaptic Function”, 3rd Neurobiology of Aging Conference, Orlando, FL 10/02
- “A Proteomic Approach for Potential Biomarker Identification”, Proteomics and Aging Workshop, National Institute of Aging, Bethesda, MD 12/02
- “Molecular Mechanisms of Alzheimer’s Disease”, Case Seminar in Aging, Monroe Community Hospital, Rochester, NY, 4/03
- “Gene Therapy: Current Reality and Future Prospect for Parkinson’s Disease”, Mercer University of Medicine, Macon, GA 4/03
- “Molecular Medicine: Its General Principles and Applications”, Core Curriculum Seminar in Internal Medicine, Mercer University of Medicine, Macon, GA 4/03
- “Gene Therapy – GDNF”, Scientific Overview Panel, 9th Annual Pan Forum Research and Education Forum and Public Policy Forum, Parkinson’s Action Network, Washington, DC 5/03
- “Molecular Genetic Manipulation of the CNS Elucidating Function and Approaching Therapies”, Kansas City Chapter of the Society for Neuroscience as a Grass Traveling Scientist, University of Kansas Medical School, Kansas City, KS 5/03
- “Central Nervous System Gene Transfer”, Education Program of the American Society of Gene Therapy 6th Annual Meeting, Washington, DC 6/03
- “Neurodegenerative Disease and Proteomics: Strategies for Therapeutic Discovery”, The Biotechnology Industry Organization (BIO), 2003 Annual Convention, Washington, DC 6/03
- “Loosening the Grip of Parkinson’s Disease”, Medical School for an Evening: ‘Progress: From the Bench to the Bedside’, University of Rochester, Rochester, NY 6/03
- “The Aging Brain and its Diseases”, Project Medical Education, “Research Rotations”, University of Rochester, Rochester, NY 8/03

"HSV Vector -mediated Gene Delivery", Plenary Speaker for the 5th International Symposium on NeuroVirology, Renaissance Harbor place Hotel, Baltimore, MD 9/03

"Molecular Approaches to Unraveling Neurodegenerative Diseases: Implications for Early Diagnosis and Novel Therapy Development", Amersham Biosciences, Piscataway, NJ 10/03

"Gene Transfer for the CNS: An Experimental Tool and Potential for Therapy", Amgen, Inc., Thousand Oaks, CA 11/03

"NAD as an Integrative Sensor: Linking Cellular Energy Metabolism and Cell Death", Nathan Shock Center Symposium, San Diego, CA 11/03

"Virus Vectors to Dissect CNS Function and Develop New Therapy", University of California, Irvine, Irvine, CA 11/03

"Molecular Mechanisms of Alzheimer's Disease", Case Seminar in Aging, Monroe Community Hospital, Rochester, NY 3/04

"The Future of CNS Gene Therapy", Neurology Grand Rounds, Johns Hopkins University, Baltimore, MD, 4/04

"Mechanisms Underlying MPTP Injury to the Mouse Substantia Nigra as Revealed by Microarray Analysis", CodeLink North American VIP Event, Chandler AZ. Sponsored by Amersham Biosciences 5/04

"Nurr1: Downstream Targets and Implications for Parkinson's Disease", Neuronal Cell Differentiation and Development at Normal and Disease Stages Workshop, Temple University, Philadelphia, PA 5/04

"HSV Amplicons for Vaccination", Neural Disorders: The Neuroimmunology of Gene Therapy Session, American Society for Gene Therapy 7th Annual Meeting, Minneapolis, MN 6/04

"Redefining Gene-based Neuroprotective Strategies", New Directions in Neuroprotection: Basic mechanisms, Molecular Targets and Treatment Strategies Workshop, New York Academy of Sciences, New York, NY 6/04

"Novel Gene Therapeutic Strategies for Neurodegenerative Diseases", Ernst Schering Research Foundation Symposium "Opportunities and Challenges of Therapies for Targeting CNS Regeneration, Yountville, CA 6/04

"Using Herpes Virus Vectors to Modify CNS Functions", FASEB Summer Research Conference, Tucson, AZ 8/04

"Biomarker Discovery and Implications for the Development of Personalized Medicine", GE Healthcare, Phoenix, AZ 10/04

"Understanding the Causes of Neurodegeneration", Invited Speaker: NIEHS Core Centers Meeting: Scientific Symposium, Research Triangle Park, NC 10/04

"Bringing Basic Discoveries in Neuroscience to the Clinic", NINDS/FDA Society for Neuroscience Symposium, Annual Society for Neuroscience Meeting 2004, San Diego, CA 10/04

"Developing a Translational Platform: The HSV Amplicon", University of Nebraska Medical Center, Omaha, NE, 11/04

"Evolving Translational Research: Misbehaving Proteins and Your Brain" Psychiatry Ground Rounds,

University of Rochester Medical Center, Rochester, NY, 12/04

“Stem Cell Research”, Rochester Rotary Club, Rochester, NY, 02/05

“Synapse Localized Virus Receptor that is Beta and Gamma Secretase Substrate”, Mayo Clinic, Jacksonville, FL, 04/05

“Gene Transfer and Novel Therapies”, ASNTR Conference, Clearwater Beach, FL, 04/05

“Herpes Virus, Receptors, Vectors, and Alzheimer’s Disease”, The J. David Gladstone Institute, San Francisco, CA, 05/05

“Stem Cell Research”, Liberty Hill Breakfast Series, Rochester, NY, 05/05

“Translational Considerations for CNS Gene Therapy”, ASGT Conference, St. Louis, Missouri, 06/05

“Application of the Herpes Amplicon Platform for the Treatment of Neurological Diseases”, 9th International Conference on Neural Transplantation and Repair, Taipei, Taiwan, 06/05

“AD Vaccination Using HSV Amplicons”, Alzheimer’s Association International Conference on Prevention of Dementia, Washington, D.C., 06/05

“Parkinson’s Disease: Evolving a Mechanism-Based Therapeutic Approach,” University of Pittsburgh, Pittsburgh, PA, 06/05

“Cytoprotective Approaches Gleaned from Caloric Restriction Studies”, Sirtris Pharmaceuticals, Waltham, MA, 06/05

“Bonomic Applications of Discovery of Prognostic Signatures in Alzheimer’s Disease”, GE Global Research Center and the Neurosciences Institute of Albany Medical Center, 10/05

“Stem Cell Research”, JCC, Rochester, NY, 11/05

“Biomolecular Profiling to Ascertain Molecular Signatures of Disease,” World Parkinson’s Congress, Washington DC, 2/06

“On the Road to a Cure for Parkinson’s Disease: Translational Research”, World Parkinson’s Congress, Washington DC, 2/06

“Gene Transfer and Neurological Disease: Current Status and Future Promise,” Keynote Speaker, ASENT, Washington DC, 3/06

“Immunoshaping Therapy for Amyloid Diseases”, Diabetes Research Center, University of Pennsylvania School of Medicine, 04/06

“Immunotherapeutic Approaches for Alzheimer’s Disease”, Taub Institute, Columbia University College of Physicians and Surgeons, 04/06

"Parkinson's Disease Modeling in the Mouse", Annual Neuroplasticity Meeting, Arrowhead CA, 05/06

"Gene Therapies in Neuropsychiatry" Presidential Keynote Speaker, American Society Biologic Psychiatry, Toronto, Canada, 05/06

"Exploiting Gene Transfer to Elucidate CNS Function and Develop Therapies", Department of Physiology, University of Kentucky School of Medicine, 05/06

"Antibody Gene Therapy: An Approach for Protein Misfolding Diseases", Neurology Grand Rounds, Johns Hopkins School of Medicine, 06/06

"Immunotherapeutic Approaches for Neurological Diseases", Neural Repair Club, Children's Memorial Research Center, Chicago, IL, 06/06

"Antibody Gene Delivery to Treat Mouse Prion Disease", Department of Biomedical, College of Veterinary Medicine, Iowa State University, Ames IA, 08/06

"Developing the Inaugural World Parkinson's Congress" Parkinson Fall Symposium, Rochester, NY, 09/06

"Novel Gene Therapeutic Strategies for Neurodegenerative Diseases," Cellular and Molecular Treatments of Neurological Diseases, Cambridge, MA, 09/06

The American Academy of Neurology Annual Meeting, Boston, Mass. May 4, 2007. Future of Neuroscience Conference: Therapy of Genetic Disorder. "Immunologic gene therapeutic approaches for the treatment of neurodegenerative diseases"

The American Society for Gene Therapy, Seattle, WA, June 2, 2007. "Therapeutic Insights Learned Parkinson's Disease Genetics"

Scheduled Presentations

The University of Maryland, Department of Microbiology, October 22, 2007

CURRENT RESEARCH INTERESTS: (Keywords)

Gene Therapy, Neurodegenerative Disease, Disease Mechanisms, Immunotherapy

PUBLICATIONS (peer reviewed)

1. Needleman, R.B., **Federoff, H.J.**, Eccleshall, T.R., Buchferer, B. and Marmur, J. (1978) Purification and Characterization of an Alpha-Glucosidase from *Saccharomyces carlsbergensis*, Biochemistry. 17(22):4657-61.
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ACTIVE RESEARCH SUPPORT

"Improved HSV Vectors: Gene Transfer into the Nervous System"

Principal Investigator: Howard J. Federoff, M.D., and Ph.D.

Agency: NIH Type: RO1 NS36420A Period: 04/01/97-08/31/07

The long-term goal of this project is to develop less pathogenic HSV vectors.

"Parkinson's Disease Gene Therapy Group"

Principal Investigator: Howard Federoff, M.D., Ph.D. (PI transferred to Dr. K. Bankiewicz, UCSF)

Agency: NIH/NINDS Type: U54 NS045309 Period: 09/30/02-08/31/07

The goal of this project is to organize a multicenter, multidisciplinary collaborative group that will lead to a large-scale safe and efficient clinical trial of gene therapy for patients with PD.

"Development and Application of Single Chain Antibodies for PD Therapy"

Principal Investigator: Howard J. Federoff, M.D., Ph.D.

Agency: Dept. of Defense Type: DAMD17-02-1-0695 Period: 11/25/02-12/24/07

The overall goal of this project is to identify and characterize humanized single chain antibodies (scFvs) that recognize structural epitopes on α -synuclein and utilize these scFvs to attenuate the pathology associated with α -synuclein misfolding.

"HSV Amplicon Vectors for HIV Vaccine Delivery" - "Refinement of HSV Amplicon Methods" (Project 3), "Amplicon Vector Production Core" (Core C) (PI transferred to Dr. W. Bowers, URMC)

Principal Investigator: Michael Keefer, Ph.D., Federoff: Project 3 PI, Core C Investigator

Agency: NIH/NIAID Type: PO1 AI056356 Period: 7/15/03-12/31/07

The overall goal of this project is to develop an HIV vaccine strategy based on the HSV-1 amplicon vector, and to test this approach in small animal and large animal models.

"Interdepartmental Neuroscience Training"

Principal Investigator: Howard J. Federoff, M.D., Ph.D. (PI Transferred to Dr. R. Giger, URMC)

Agency: NIH/NINDS Type: T32 NS007489 Period: 09/30/00-06/30/10

This is a broad neuroscience-training grant to support 6 students in each of years one and two of graduate school.

"Amplicon BAC Engineering to Discover New Molecules Involved in Neural Regeneration & Repair"

Principal Investigator: Howard J. Federoff, M.D., Ph.D. (PI Transferred to Dr. R. Giger, URMC)

Agency: Johnson and Johnson Period: 07/15/05-07/14/07

Introduction of arginase 1 into postnatal cerebellar granule neurons (CGNs) using HSV-mediated gene transfer.

“Nectin-1: Synaptic Processing and Functions”

Principal Investigator: Howard J. Federoff, M.D., Ph.D.
Agency: NIH/NIA Type: R01AG27233

Period: 12/01/05-11/30/10

“Astrocytes, HIF-1 α and neuronal survival during stroke”

Principal Investigator: Howard J. Federoff, M.D., Ph.D., (PI Transferred to Dr. D. Rempe, URMC)
Agency: NIH/NIA Type: R01 Period: 12/01/06-11/30/11

“The Role of Astrocytes in Ischemic Stroke”

Principal Investigator: Nedergaard, Maiken

Project 2 Principal Investigator: Howard J. Federoff, M.D., Ph.D. (PI Transferred to Dr. D. Rempe, URMC).

Agency: NIH/NINDS Type: P01 NS050315 Period: 12/01/06-11/30/11

Goal of this project: Evaluate the role of HIF-1 α in mediating the neuroprotective roles of astrocytes during stroke, following HPC, and with administration of HM compounds.

“University of Rochester Medical Center Funds - “The Rochester Study”

Principal Investigator: Howard J. Federoff, M.D., Ph.D. (PI Transferred to Dr. W. Hall, URMC)
Period: 07/01/05 – 06/30/08

Goal of this project: To develop a community-based research infrastructure rooted in the identification of robust clinical biomarkers for diagnosing and treating a variety of human diseases.

General Clinical Research Center (Georgetown University)

Principal Investigator: Howard J. Federoff, M.D., Ph.D.

Agency: NIH, NCRR Type: M01 RR023942-01 Period: 5/1/07 - 03/31/2010

“Proteomic Biomarker Discovery in PD”

Principal Investigator: Howard J. Federoff, M.D., Ph.D.

Agency: NIH/NINDS Type: 1R21 NS052151-01 Period: 07/01/05-09/01/07

The goals of this project are to discover, validate and apply proteomic biomarkers from leukocytes of Parkinson's disease patients

COMPLETED RESEARCH SUPPORT

“Somatic Mosaic Analysis of NGF Function in Mice”

Principal Investigator: Howard J. Federoff, M.D., Ph.D.

Agency: NIH Type: R01 MH57047 Period: 04/01/97-03/31/02

Long-term goal of project: to study NGF somatic mosaics generated in the murine central nervous system

“Roles of Neuronal Function in Craniofacial Development”

Principal Investigator: S. Kyrikanides, R.D.S. **Co-Investigator:** Howard J. Federoff, M.D., Ph.D.

Agency: NIH/NIDCR Type: R03 DE13860 Period: 09/01/00-08/31/02

The goal of this project is to determine the roles of neuronal function in craniofacial development

"A Murine Model of Genetic and Environmental Neurotoxicant Action"

Principal Investigator: Richfield, Eric

Agency: DoD

Type: DAMD17-98-1-8628

Period: 09/01/98-08/31/04

Role: Co-Investigator

Goal of project: The development of a transgenic mouse model of Parkinson's disease using the somatic approach to mimic the course & neuropathology of human Parkinson's disease

"Improved HSV Vectors: Gene Transfer into the Nervous System"

Principal Investigator: Howard J. Federoff, M.D., Ph.D.

Agency: NIH

Type: RO1 NS36420A

Period: 04/01/97-08/31/06

The long term goal of this project is to develop less pathogenic HSV vectors.

"uPA Receptor Signaling and Cell Migration"

Principal Investigator: Davies, Mark (PI)

Agency: NIH/NHLBI

Type: K08 HL67746

Period: 09/04/01-08/31/06

Goal of this project: To define the uPAR pathway with particular reference to uPAR G-protein interactions and to identify the downstream elements involved. Role: Mentor

"Rochester Nathan Shock Center"

Principal Investigator: Federoff, Howard J. (PI)

Agency: NIH/NIA

Type: P30 AG18254

Period: 09/01/00-06/30/06

Goal of this project: To enhance the quality of research in the basic biology of aging, to facilitate coordination of research on aging, to create a regional/national resource for molecular and cellular technologies and to create an environment for faculty growth in aging research.

"Chemokine Enhanced Immune Therapy of Lymphoma"

Principal Investigator: Rosenblatt, Joseph (PI)

Agency: NIH/NCI

Type: R01 CA87978

Period: 07/01/00-06/30/04

This project is a pre-clinical trial of gene therapy for leukemia and lymphoma. Dr. Rosenblatt has left the University of Rochester; no subcontract arrangement has been set up. Role: Co-Investigator

"Examining the Necessity of Huntington Function in Mature Neurons *In Vivo*"

Principal Investigator: Howard J. Federoff, M,D.,Ph.D.

Agency: Hereditary Disease Foundation

Type: Research Grant

Period: 5/01/99-04/30/03

The long term goal of this project is to combine the delivery of viral vectors with the profiling of message expression to define the molecular pathway to cell death in Huntington's disease which could then provide a rational basis for the selection of additional therapeutic targets.

"Molecular Modulation of HSV Vector CNS Interactions"

Principal Investigator: Olschowka, John (PI)

Agency: NIH/NINDS

Type: RO1 NS38577

Period: 04/20/00-03/31/04

Goal of project: To understand the causes of inflammation seen during CNS gene therapy and secondly to reduce their significance on transgene expression.

Role: Co-Investigator

"Environmental Neurotoxicant Genetic Action: Murine Model"

Principal Investigator: Federoff Howard J. (PI)

Agency: NIH/NIEHS Type: R01 ES09391

Period: 05/01/98-03/31/04

Goal of project: To generate mice with conditional dopamine transport gain of function.

"Methods for Analysis of Gene Function in Neural Networks"

Principal Investigator: Federoff, Howard J. (PI)

Agency: NIH/NIA Type: R01 AG18231

Period: 04/15/00-03/31/04

Goal of project: To develop novel tools to help us understand the temporal and ordered sequence of molecular events that result in adaptive plasticity.

"Single-chain Antibody Therapy for Prion Disease"

Principal Investigator: Federoff, Howard J. (PI)

Agency: NIH/NIA Type: R21 AG21610

Period: 09/30/02-08/31/04

Goal of project: To circumvent the lack of a host-based immune response to impede the conversion of PrP^c in C57BL/6 mice challenged with PrP^{Sc} by utilizing a herpes simplex virus (HSV) amplicon-based gene therapy strategy to express novel PrP^c-specific single-chain variable fragment (scFv) antibody coding sequences.

"Peripheral Leukocyte Biomarkers in Alzheimer's Disease"

Principal Investigator: Howard J. Federoff, MD, PhD

Agency: NIH/NIA Type: R21 AG025354

Period: 09/30/04-06/30/07

The major goal of this project is to identify a unique set of leukocyte proteins that will identify a unique set of leukocyte proteins that will differentiate LOAD from non-LOAD subjects and will provide important information on the diagnosis, progression, pathophysiology and potential therapies for LOAD.

"HSV Amplicon-mediated Disruption of A β Fibrillogenesis"

Principal Investigator: Howard J. Federoff, M.D., Ph.D.

Agency: NIH/NIA Type: R01 AG020204

Period: 09/30/03-07/31/07

The goal of this project is to elucidate the role of fibrillization in the genesis of disease and establish the utility of amplicon-based vaccination for AD.

"Ancillary Study to ADC Valproate Trial"

Principal Investigator: Howard J. Federoff, M.D., Ph.D.

Agency: Abbott Laboratories

Period: 07/01/03-07/14/07

Goal of this project: To determine that specific valproate-mediated biochemical alterations will correlate with clinical and structural imaging responses.